EXHIBIT 12

DECLARATION OF LEIF PETERSON IN SUPPORT OF HUAWEI'S OPPOSITION TO SAMSUNG'S MOTION TO PARTIALLY EXCLUDE AND STRIKE

REDACTED VERSION OF DOCUMENT SOUGHT TO BE SEALED

References material marked HIGHLY CONFIDENTIAL

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

HUAWEI TECHNOLOGIES CO., LTD., HUAWEI DEVICE USA, INC., and HUAWEI TECHNOLOGIES USA, INC., Plaintiff(s)/Counterclaim Defendants, vs. SAMSUNG ELECTRONICS CO., LTD, SAMSUNG ELECTRONICS AMERICA, INC., Defendants / Counterclaim-Plaintiffs, and SAMSUNG RESEARCH AMERICA, INC., Defendant, v. HISILICON TECHNOLOGIES CO., LTD., Counterclaim-Defendant.	Case Number: 3:16-cv-2787-WHO **References Discovery Material Marked "Highly Confidential - Attorneys' Eyes Only"**

Supplemental Report of Dr. Charles L. Jackson Regarding the 3GPP Patent Landscape

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1 Introduction and Overview

I am the same Charles Jackson who provided an opening report in this matter on April 27, 2018 ("Jackson Opening Report") and a rebuttal report on May 26, 2018 ("Jackson Rebuttal Report"). My background and biographical information is set forth in the Jackson Opening Report. I was asked to respond to that part of Dr. Leonard's rebuttal report that addresses for the first time the use of citation analysis to value patent portfolios. This report contains that response.

2 Dr. Leonard's Use of the Citation Analysis Literature

Dr. Leonard refers to eight publications as support for the use of citation analysis in assessing patent portfolio value. I provide a summary and excerpts of each publication in Exhibit 1. None of these publications supports Dr. Leonard's use of citation analysis. For example:

- Fischer and Leidinger (2014) concluded that (1) forward citations "explain only a small variance in patent value," of 0.5% to 1.2%; (2) "the explanatory power of forward citations is quite limited"; (3) previous research recognized a "noisy relationship between forward citations and patent value," such as explaining variance by only 1.4%; and (4) the effect was studied in patents more than 5 years old.[1]
- Harhoff et al. (2003) used regression analysis to create a model that uses citation analysis as one of eight variables to predict patent value. Even with all eight variables, their model had a pseudo-R-squared of 0.139, which means that it explains little of the variation in the value of patents.
- Harhoff et al. (1999) performed a regression analysis of U.S. patents and found that "[t]he relatively low R^2 values for all regressions reveal that the citation-value relationship is quite noisy."[2]
- Schankerman (1998) is a study of the value of French patents based on data about renewals. This paper provides no new data or insights on citations and patent value.
- Jaffe and Trajtenberg (2002) (which reprints Trajtenberg [1990]) relied on data in which (1) the few early patents related to CT-scan technology were heavily cited and (2) the value that was added by CT scanners was high in the early years and then declined. Given data with this structure, finding a high correlation between patents weighted by citations and value is to be expected. Perhaps the most important question regarding this study is the extent to which the pattern of invention and value over time are duplicated for other technologies and other industries. Few innovations in wireless have had the impact on the wireless industry that Hounsfield's invention had on the CT industry. The structure underlying the Trajtenberg publication, which involved the pioneer patent on a

[1] Fischer and Leidinger (2014) at pp. 519, 521, 527.

[2] Harhoff et al. (1999) at p. 4.

> Nobel prize-winning invention, is not present in the modern wireless industry, and therefore Trajtenberg's results are unlikely to apply to 3GPP standards-essential patents (SEPs).

- Breitzman and Thomas (2002) did not report any details on their regression model except that it had an R^2 of 0.4291. Nothing in this paper supports a quantitative weighting of citations to assess patent value.
- Bekkers et al. (2014) note that the time pattern of citations to SEPs differs from that of non-SEPs, with the citation rate being lower for SEPs during the first 5 years after grant and higher in later years.[3] This publication does not provide any additional quantitative support for citation analysis as a means for valuing patents or patent portfolios.

3 Other Literature on Citation Analysis

Several publications emphasize the fact that, although citations are correlated with patent value, that association is weak and citation counts are poor predictors of patent value. For example, Gambardella et al. (2008) state,

> Our measure is significantly correlated with the number of patent citations, references, claims, and countries in which the patent is applied. Citations explain value as much as the other three indicators combined, and the right tail of citations is correlated with the right tail of our value measure. *Yet, the four indicators only explain 2.7% of the variance of patent value.*[4]

Likewise, Bessen states,

> In no case did the portion of variance explained equal as much as 6%. In other words, as other researchers have also concluded, patent citation statistics are correlated with patent value, but they are very "noisy signals." This analysis indicates just how noisy they are.[5]

The fact that the regressions of the relationship between forward citation count and patent value estimated model coefficients that are statistically significant is no surprise, but it does not mean that these coefficients are necessarily significant in any practical sense. These regressions considered many patents. It is well-known that analysis of large data sets almost guarantees that the results will have statistical significance (small p-values). The American Statistical Association, the primary professional society for statisticians, recently released a statement on significance testing. They stated,

> Statistical significance is not equivalent to scientific, human, or economic significance. Smaller p-values do not necessarily imply the presence of larger or more important effects, and larger p-values do not imply a lack of importance or even lack of effect. Any

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[3] Bekkers et al. (2014) at pp. 30–32.

[4] Gambardella et al. (2008) at p. 69. Emphasis added.

[5] Bessen (2008) at p. 941.

> effect, no matter how tiny, can produce a small p-value if the sample size or measurement precision is high enough, and large effects may produce unimpressive p-values if the sample size is small or measurements are imprecise.[6]

Moreover, underlying patterns regarding citations that have been identified by the analysis of U.S. patents filed by U.S. inventors may not apply to U.S. patents with Chinese or Korean inventors, let alone to a comparison of U.S. patents issued to Chinese inventors with U.S. patents issued to Korean inventors. National practice in filing patents and citing prior art varies. Chinese patents will be cited less than English-language patents due simply to the language barrier. One study showed enormous variation in the citing practices of U.S. patents across inventors of different nationalities.[7] For example, that study showed that the examiner added all citations in 61% of the 11,268 Korean-inventor patents studied and added 80% of the citations in the average Samsung patent.[8] In contrast, the examiner added all citations to only 27% of patents with inventors from Sweden. Extrapolating from a weak and flawed measure calibrated on one population to a different population is very questionable reasoning.

4 Dr. Leonard's Use of Citation Analysis

Dr. Leonard describes how he uses citation counts in Exhibit 4b of his report. In Exhibit 2, I quote Dr. Leonard's summary of his methodology and reconstruct his methodology, because Dr. Leonard does not provide a complete description of it in his report. On the basis of my review of Dr. Leonard's citation analysis, I believe it is profoundly flawed for several reasons.

First, the literature on citation analysis shows that citation analysis, even if properly done and with the right data available, can explain very little of the value of a patent portfolio. For instance, Bessen states that "In no case did the portion of variance explained equal as much as 6%."[9] The correlations observed in the literature are likely of little probative value because of (1) the nature of statistics performed on large data sets as I explained above and (2) the low R^2 values reported in these studies.

Second, [redacted] As noted above, one study showed enormous variation in the citing practices of U.S. patents across inventors of different nationalities, and language barriers almost guarantee

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6 Wasserstein, R. L., & Lazar, N. A. (2016) at p. 8

7 Alcácer et al. (2008).

8 Ibid at Table 1 and Table 5.

9 Bessen (2008) at p. 941.

differences in numbers of citations. I understand that Chinese patent law requires firms to file patent application in China first, before filing outside China, similar to some U.S. patent rules.[10] The Chinese patent application are filed in Chinese and understandably garner few citations because of a simple language barrier. [redacted]

[redacted]

[redacted]

[redacted].

10 *See* https://www.uspto.gov/web/offices/pac/mpep/s140.html

11 [redacted]

12 In the United States, patent applications are usually published 18 months after filing. See USPTO MPEP 1120. Patents are usually issued about 18 months later, but some patents take far longer to issue.

13 See Exhibit 2, where I provide a fuller response to the mechanics of Dr. Leonard's analysis.

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[redacted]

5 Conclusions

Based on the above, citation analysis appears to be, at least in part, an example of the *streetlight fallacy*—searching for lost keys where the light is good rather than searching near where one thinks one lost the keys. Citations are easy to measure. So, economists study citations even though citation counts have only a weak and uneven connection to patent value.

[redacted] Dr. Leonard's conclusions based on citation weighting should not be relied upon.

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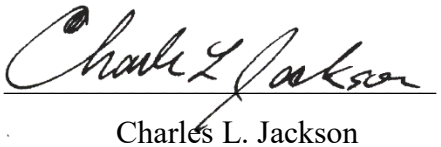
Executed on this 11th day of June, 2018 in Washington, DC.



Charles L. Jackson